PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of	Docket No: Q68079
Kenji TERAO	
Appln. No.: 10/043,165	Group Art Unit: 2637
Confirmation No.: 5038	Examiner: QUTBUDDIN GHULAMALI
Filed: January 14, 2002	

For: CDMA RECEIVER PERFORMING A PATH SEARCH, PATH SEARCH METHOD, AND PROGRAM THEREFOR

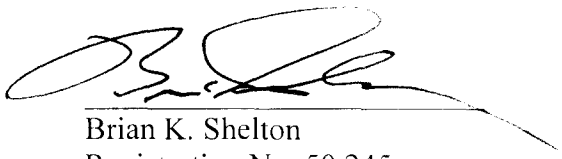
RE-SUBMISSION OF APPEAL BRIEF

MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith please find an Appeal Brief. A check for the statutory fee of $500.00 was previously attached to the Appeal Brief filed October 18, 2006, thus no additional fees are believed to be required at this time. The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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Date: **December 5, 2006**

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RE-SUBMISSION OF APPEAL BRIEF UNDER 37 C.F.R. § 41.37

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Sir:

In accordance with the provisions of 37 C.F.R. § 41.37 and in response to the Notice of Non-Compliant Appeal Brief dated November 6, 2006, Appellant submits the following:

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RE-SUBMISSION OF APPEAL BRIEF UNDER 37 C.F.R. § 41.37
U.S. Application. No. 10/043,165
Attorney Docket No. Q68079

I. REAL PARTY IN INTEREST

The real party interest is NEC CORPORATION, the assignee of the present application. The assignment was recorded on January 14, 2002, in the U.S. Patent and Trademark Office at Reel 012477, Frame 0173.

II. RELATED APPEALS AND INTERFERENCES

Upon information and belief, there are no other prior or pending appeals, interferences, or judicial proceedings known to Appellant, Appellant's representatives of the Assignee that may be related to, be directly affect by, or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

Claims 1-3,5,6,8-11,13-15 and 18-20 are pending in the present application, of which claims 1-3, 5,6,8-11, 18 and 19 have been allowed and claims 13-15 and 20 stand finally rejected.

Claims 13-15 and 20 have been rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by Hiramatsu (U.S. Patent Number 6,498,928).

No other ground of rejection or objection is currently pending.

A copy of the pending claims on appeal is set forth in the attached APPENDIX.

IV. STATUS OF AMENDMENTS

Amendments to the claims were submitted in an Amendment Under 37 C.F.R. § 1.111 filed on July 5, 2005, in response to the Non-Final Office Action dated April 4, 2005.

Amendments to the claims were also submitted in an Amendment Under 37 C.F.R. § 1.116 filed January 19, 2006, in response to the Final Office Action dated April 5, 2005.

All amendments and arguments are believed to have been previously entered and made of record, including the amendments to the claims filed after the final rejection of the claims in the Final Office Action dated April 5, 2005.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

The following is a concise explanation of the subject matter defined in each of the independent claims involved in the instant appeal.

For the Board's convenience, Appellant will first describe the relevant art (pages 1-3 of the Specification), and then independent claims 13 and 20 with reference to the exemplary embodiments of the invention (pages 3-41 of the Specification). This discussion of the exemplary embodiments and the pending claims is provided for explanatory purposes only, and is not intended to limit the scope of the claims.

Generally, the invention relates to a path searching method in a code division multiple access (CDMA) receiver, which can reduce calculation time by adjusting the frequency of searching among a plurality of regions in which a searching for a peak electrical power is performed. *See* Specification at page 1, lines 9-14.

The Related Art

In mobile communication systems in which a direct sequence code division multiple access (DS-CDMA) receiver performs multipath access using spread spectrum technology, a delay profile is measured, in which a number of paths having a large signal power are selected within a measurement range and assigned to individual "fingers". The selected paths may be synthesized into what is known as a "Rake synthesis" receiver, where each finger performs an

inverse spread of one assigned path and establishes symbol synchronization. *See* Specification at page 1, lines 17-26.

Due to non-uniformity of propagation paths for each of a plurality of received signals in a CDMA transmission, multiple waveforms will exist that have differing delay times. By using broadband spread encoding to spectrally spread narrow-band data, it is possible to separate and extract these multiple signals having different propagation delays in the form of a delay profile. *See* Specification at page 1, line 26 - page 2, line 15.

However, because the position of a mobile station with respect to a base station in a communications system may vary, a change in the surrounding radio propagation environment may result as well as a change in the associated delay profile. This movement of a mobile station relative to a base station, which can lead to the accompanying change in the delay profile, can further result in a change in the delay time of the path to be synthesized by Rake synthesis. Thus, it is important to immediately track a change in the delay profile and to perform Rake synthesis so as to obtain the maximum signal power. To track such changes, multipath searching and tracking functions have been used. *See* Specification at page 2, lines 16-27.

However, previous approaches entail a huge amount of calculations in order to perform the processing to search for an effective path from all of the data, which may involve a large amount of delay profile data. *See* Specification at page 3, lines 1-9.

Claim 13

Claim 13 is directed to a method for path searching for a CDMA receiver whereby a path is detected by searching at a prescribed time for a delay profile indicating a signal power distribution with respect to a delay time of a received signal. The claim recites an operation of dividing the delay profile into a plurality of regions based on the delay time and selecting at least one of the regions at each of the timings as a designated object for a signal power detection. An embodiment of the dividing operation is described at page 12, lines 12 - page 13, line 5 and Figures 2 and 3.

In addition, claim 13 recites searching and detecting a signal power within the selected region and determining a signal power distribution condition. An embodiment of the searching and detecting is described at page 13, lines 6-15.

Further, claim 13 recites the features of establishing a priority of a region in response to the signal power condition and designating a region to be selected as an object for detecting the signal power so that the higher priority a region possessing, with the higher frequency can be designated. Embodiments of the establishing and designation operations is described at page 13, line 16 - page 15, line 13 and page 25, line 27 - page 29, line 11 and Figure 7.

Claim 20

Claim 20 is directed to a computer program for path searching for a CDMA receiver whereby a path is detected by searching at a prescribed timing for a delay profile indicating a

signal power distribution with respect to delay time of received signals. The claim recites an operation of dividing the delay profile into a plurality of regions based on the delay time and selecting at least one of the regions at each of the timings as a designated object for a signal power detection. An embodiment of the dividing operation is described at page 12, lines 12 - page 13, line 5 and Figures 2 and 3.

In addition, claim 20 recites searching and detecting a signal power within the selected region and determining a signal power distribution condition. An embodiment of the searching and detecting is described at page 13, lines 6-15.

Further, claim 20 recites the features of establishing a priority of a region in response to the signal power condition and designating a region to be selected as an object for detecting the signal power so that the higher priority a region possessing, with the higher frequency can be designated. Embodiments of the establishing and designation operations is described at page 13, line 16 - page 15, line 13 and page 25, line 27 - page 29, line 11 and Figure 7.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Claims 13-15 and 20 have been rejected under 35 U.S.C. § 102 (e) as allegedly being anticipated by Hiramatsu.

VII. ARGUMENT

Rejection of Claims 13 and 20 Under 35 U.S.C. § 102(e) over Hiramatsu

The rejection of claims 13 and 20 is improper because Hiramatsu fails to anticipate all the claim limitations.

Hiramatsu does not disclose or suggest the searching and detecting of a signal power within a selected region, whereby the selected region is a designated object for signal power detection. Regarding the rejection of claims 13 and 20, Appellant respectfully submits that, as recited by claims 13 and 20, *the selected region is selected at each prescribed timing from among a plurality of regions of a delay profile indicating a signal power distribution with respect to a delay time of received signal, the delay profile being divided into the plurality of regions based on the delay time of received signal.*

On the contrary, the disclosure of Hiramatsu only discloses a radio reception apparatus which receives signals from all directions through a plurality of directives. The radio reception apparatus generates a delay profile to each directivity and selects a path having the largest received signal among a plurality of delay profiles generated by suppressing interference signals after thus narrowing down directions. (See Abstract). All signals from directions, except for the direction to which directivity is generated, become interference signals when directivity reception is performed. The interference amount in each directivity is decreased by dispersing the interference signals by providing a plurality of fixed directivities (column 2, lines 22-31).

In Hiramatsu, delay profiles generated for each fixed directivity results in narrowed down directions from which interference signals reach, thus suppressing the interference amount of the interference signals for performing the detection of reception timing or the selection of a path (column 2, lines 32-37). As shown in FIG. 3, signals isolated by every directivity are output to correlators (108-110), respectively (column 3, lines 11-12).

The outputs from the correlators (108-110) are output to power detection circuits (111-113) and their power is detected (column 3, lines 27-29). The detection results are output to delay profile generating circuits (114-116) and delay profiles are generated by every directivity (column 3, lines 29-31). A determination circuit (117) receives delay profile information and determines the timing of a peak at which the reception power is largest among respective delay profiles as the reception timing (column 3, lines 31-36).

Additionally, at the same time, a determination circuit (127) in Hiramatsu determines from a delay profile generated in a delay profile generating circuit (126), the timing of a peak at which the reception power is largest among respective delay profiles as the reception timing (column 3, lines 37-58). See also column 6, lines 46-67.

Therefore, because of these specific differences as discussed above, Hiramatsu does not search and detect a signal power within a selected region, whereby the selected region is a designated object for signal power detection. Contrary to the claimed invention, Hiramatsu only discloses generation of delay profiles by every directivity over all directions (column 6, lines 4748). The delay profiles in Hiramatsu are not searched with a prescribed timing, nor are they divided into a plurality or regions **based on delay time**. As the Examiner has stated in paragraph

3 on page 2 of the Office Action dated September 19, 2005, Hiramatsu operates to detect the timing and the direction that delay profiles become the maximum (column 6, lines 48-53). Furthermore, the delay profiles in Hiramatsu are generated by every directivity in the detection of the reception timing (column 7, lines 17-21). Thus, Hiramatsu only discusses spatial diversity with a delay profile by each directivity, but does not at all mention searching of a delay profile **with a prescribed timing**, the delay profile being divided into a plurality of regions **based on delay time**. As column 6, lines 48-53 of Hiramatsu suggest, Hiramatsu's delay profiles are generated by every directivity over all directions (fixed directivities), but there is no division of the delay profile into a plurality of regions based on delay time. Therefore, not all of the elements as recited by claims 13 and 20 are taught or suggested by Hiramatsu.

For at least the aforementioned reasons, claims 13 and 20 and dependent claims 14 and 15 should be deemed allowable.

Unless a check is submitted herewith for the fee required under 37 C.F.R. §41.37(a) and 1.17(c), please charge said fee to Deposit Account No. 19-4880.

RE-SUBMISSION OF APPEAL BRIEF UNDER 37 C.F.R. § 41.37
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The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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Date: **December 5, 2006**

CLAIMS APPENDIX

CLAIMS 1-3, 5, 6, 8-11, 18 and 19 have been allowed. CLAIMS 13-15 and 20 on APPEAL:

1. (previously presented): A CDMA receiver performing a path search by searching with a prescribed timing a delay profile indicating a signal power distribution with respect to delay times of received signals, comprising:

a separating means, which divides said delay profile into a plurality of regions, based on said delay time, and which selects at least one of said regions at the respective timings as a designated object for a signal power detection;

a detection means, which performs a signal power detection within said selected region, and determines a signal power distribution condition;

a priority establishing means, which establishes a priority of a region in response to said signal power distribution condition; and

a region designation means, which designates a region to be selected in said separating means as an object for said signal power detection so that the higher priority a region possessing, with the higher frequency can be designated.

2. (previously presented): The CDMA receiver according to claim 1, wherein said detection means searches for a peak signal power within said selected region, and wherein said

region designation means designates a region to be selected so that the higher peak signal power a region possessing, with the higher frequency can be designated.

3. (previously presented): The CDMA receiver according to claim 2, wherein a peak signal power used in determining said designation frequency of said region is a total signal power of a plurality of signal peaks within said region.

4. (canceled).

5. (previously presented): The CDMA receiver according to claim 1, wherein each one of said regions comprises time periods that are either equal to or different from each other.

6. (previously presented): The CDMA receiver according to claim 5, wherein there exists an overlapped time period in each of said region with respect to the neighboring region thereto.

7. (canceled).

8. (previously presented): The CDMA receiver according to claim 19, wherein said classifying means controls regions included among said first region so that, when path information corresponding to a single peak signal power among total signal power within a region is assigned to said finger section, said region is still to be included in said first regions, and when path information corresponding to a total signal power of a plurality of signal peaks within a region is assigned to said finger section, said region is to be excluded from said first region.

9. (previously presented): The CDMA receiver according to claim 3, wherein said total signal power of a plurality of signal peaks within said region is calculated so that a respective different value of multiplier is applied to each peak signal power in order that the higher peak signal power among all of the regions processing, the multiplier of larger value is applied.

10. (previously presented): The CDMA receiver according to claim 3, wherein said total signal power of a plurality of signal peaks within said region is obtained by an average value of peak signal powers detected by one or more searching for said region.

11. (previously presented): The CDMA receiver according to claim 3, wherein said total signal power of a plurality of signal peaks within said region is obtained by weighting a respective different value of weight to each peak signal power in a region in order that the higher designated frequency said region possessing, the weight of higher value is applied.

12. (canceled).

13. (previously presented): A method for path searching for a CDMA receiver whereby a path is detected by searching at a prescribed timing for a delay profile indicating a signal power distribution with respect to a delay time of received signal, said method comprising:

dividing said delay profile into a plurality of regions, based on said delay time, and selecting at least one said regions at each of said timings as a designated object for a signal power detection;

searching and detecting a signal power within said selected region, and determining a signal power distribution condition;

establishing a priority of a region in response to said signal power distribution condition; and

designating a region to be selected as an object for detecting said signal power so that the higher priority a region possessing, with the higher frequency can be designated.

14. (previously presented): The path search method according to claim 13, whereby a peak signal power within said selected region is detected, and whereby a priority is allocated to said region so that the higher peak signal power a region possessing, at the higher priority can be allocated.

15. (previously presented): The path search method according to claim 14, whereby said priority is calculated based on a peak signal power obtained at each one of said timings, and whereby a frequency for designating said region is calculated based on said priority, and further whereby calculation of said priority and frequency is performed by a prescribed algorithm.

16. (canceled).

17. (canceled).

18. (previously presented): A CDMA receiver comprising:

a delay profile measuring section for measuring a delay profile indicating a signal power distribution with respect to delay time of received signals;

a path search section for searching with a prescribed timing said delay profile;

a rake receiver section; and

a finger section for passing data assigned by said path search section to said rake receiver section;

wherein said path search section includes:

a separating means, which divides said delay profile into a plurality of regions, based on said delay time, and which selects at least one of said regions at the respective timings as a designated object for a peak signal power detection;

a detection means, which performs a peak signal power detection within said selected region, and determines a signal power distribution condition;

a priority establishing means, which establishes a priority of a region in response to said peak signal power of said signal power distribution condition; and

a region designation means, which designates a region to be selected in said separating means as an object for said peak signal power detection so that the higher priority a region possessing, with the higher frequency can be designated,

wherein a peak signal power to be detected by said detection means is a total signal power of a plurality of signal peaks within said region.

19. (previously presented): The CDMA receiver according to claim 18, wherein said priority establishing means further having a classifying means, which classifies said regions into first regions including a relatively large peak power distribution and second regions which are other than said first regions, and

wherein said region designation means designates said first regions in a high frequency and said second regions in a low frequency.

20. (previously presented): A computer program for path searching for a CDMA receiver whereby a path is detected by searching at a prescribed timing for a delay profile indicating a signal power distribution with respect to delay time of received signals, said computer program comprising:

dividing said delay profile into a plurality of regions, based on said delay time, and selecting at least one of said regions at each one of said timings as a designated object for a signal power detection;

searching and detecting a signal power within said selected region, and determining a signal power distribution condition;

establishing a priority of a region in response to said signal power distribution condition; and

designating a region to be selected as an object for detecting said signal power so that the higher priority a region possessing, with the higher frequency can be designated.

EVIDENCE APPENDIX:

None.

RELATED PROCEEDINGS APPENDIX

None.